

Image 1765



Mail Stop Appeal Brief

PATENT

Customer Number 22,852

Attorney Docket No. 04329.2199

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re Application of:)
)
Kenro NAKAMURA, et al.) Group Art Unit: 1765
)
Serial No.: 09/453,831) Examiner: Umez-Eronini, Lynette T.
)
Filed: December 2, 1999)
)
For: POLISHING METHOD AND)
POLISHING LIQUID)

Mail Stop Appeal Brief - Patents

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Sir:

REPLY BRIEF

Appellants respectfully submit this Reply Brief in triplicate under 37 C.F.R.

§ 1.193(b)(1), in response to the Examiner's Answer, mailed on December 29, 2003. Since the period for filing a Reply Brief extends to February 29, 2004, this Reply Brief is timely filed.

I. Response to Examiner's Statement of the Issues

Appellants respectfully submit that the Examiner provided a misleading characterization of the issues on pp. 2 – 3 of the Examiner's Answer. While the Examiner did withdraw the 35 U.S.C. § 112, first paragraph rejection, the Examiner improperly characterized the remaining issues on appeal as only being specific elements of Appellants' claims 12, 17, and 22.

Specifically, the Examiner stated "the issues at hand are whether a solvent is added to a first

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polishing liquid for dilution to form a second polishing liquid; whether the addition of the solvent is carried out upon or immediately before the polishing of the substrate; and whether a Ru (ruthenium) compound is SrRuO_3 ” (Examiner’s Answer, pp. 2 – 3).

First, Appellants submit that the “issues” are not the specific claim elements Appellants’ have discussed previously (in the Appeal Brief) to demonstrate the impropriety of the Examiner’s rejections. Rather, the issues are those specifically outlined in the Appeal Brief, namely “B,” “C,” and “D” on p. 6, and Appellants respectfully draw the Board’s attention to that statement of the issues, which the Examiner already acknowledged as correct. *See* Examiner’s Answer, p. 3 (“the appellants’ statement of the issues in brief is correct”). “In determining the differences between the prior art and the claims, the question under 35 U.S.C. 103 is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole would have been obvious. *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 218 USPQ 871 (Fed. Cir. 1983)” M.P.E.P. § 2141.02. Appellants do not wish to allow the Examiner to reduce the present invention down to only a specific subset of claim elements, while ignoring the larger issues addressed in the October 20, 2003 Appeal Brief.

Second, Appellants submit that the Examiner’s characterization of the issues might serve to improperly limit Appellants’ claims to only those specific elements in the Examiner’s version of the issues an appeal. Appellants submit that the Examiner is not looking at Appellants’ claimed invention as a whole, and is focusing on only one area of the invention to the exclusion of other parts that would enable one of ordinary skill in the art to appreciate the invention. “Distilling an invention down to the “gist” or “thrust” of an invention disregards the requirement of analyzing the subject matter “as a whole.” *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721

F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984)” M.P.E.P.

§ 2141.02.

Third, Appellants respond to the Examiner’s statement that one issue is “whether a Ru (ruthenium) compound is SrRuO_3 ” (Examiner’s Answer, p. 3), by pointing out that the language of Appellants’ claim 12, and Appellants’ specification already make clear on the record that (1) “[a] polishing method according to claim 17, wherein said Ru compound is SrRuO_3 ” (Appellants’ claim 12), and (2) “[a] typical example of the Ru compound that is to be polished in the present invention is SrRuO_3 ” (Appellants’ specification, p. 8, ll. 4 – 5)” (Appeal Brief, p. 15).

Appellants respectfully submit to the Board that the Examiner’s characterization of the issues misleads and draws attention away from Appellants’ claimed invention as a whole, and thus tends to obscure the impropriety of the Examiner’s three 35 U.S.C. § 103(a) rejections.

II. Treatment of Certain Claims

Appellants submit that claims 23 and 25 still have not been treated on the merits since their introduction on March 11, 2003. The Examiner only mentioned claims 23 and 25 in passing, in the body of the rejection of claims 11 and 17 – 21 (for claim 23), and in the rejection of claim 22 (for claim 25) in both the Final Office Action of May 20, 2003, and in the Examiner’s Answer of December 29, 2003. This deficiency in the examination of the present application has persisted since the introduction of claims 23 and 25, and was perpetuated in the Examiner’s Answer, wherein Appellants note that the text of the rejections are nearly exact duplicates of those contained in the May 20, 2003 Final Office Action.

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III. Response to Examiner's Arguments pertaining to (A) rejection of claims 11 and 17 – 21 under 35 U.S.C. § 103(a) over Westmoreland (U.S. Patent No. 6,143,192) in view of Danielson, et al. (U.S. Patent No. 5,407,526)

A. The Examiner alleged

“Appellants’ argument is not persuasive because one skilled in the art would understand that dilution steps are conventional in preparing final solutions of desired concentrations. Since the reference [Westmoreland] discloses a solution with a specific amount/concentration of water, it would naturally encompass conventional preparation steps to attain the desired final concentration including the dilution step claimed by appellants. Appellants have not shown any evidence of criticality with respect to their claimed conventional dilution step. As a result, it does not patentably distinguish the claims” (Examiner’s Answer, p. 9).

In response, Appellants respectfully point out that if an Examiner maintains a 35 U.S.C. § 103(a) rejection, “the examiner must then consider any evidence supporting the patentability of the claimed invention, such as any evidence in the specification or any other evidence submitted by the applicant. The ultimate determination of patentability is based on the entire record, by a preponderance of evidence...” M.P.E.P. § 2142.

Appellants submit that the Examiner has not fully appreciated the present invention. Appellants’ claimed polishing liquid is discussed in the specification, which points out why their claimed “addition of the solvent [that] is carried out upon or immediately before the polishing of said substrate” (claim 17) is not conventional:

“In general, a cerium (IV) compound is stable where the compound is contained in a solution in a high concentration. If the solution is diluted to lower the concentration of the cerium (IV) compound, however, the oxidizing power and polishing capability of the compound are lowered with time. It follows that, in the case of using a polishing liquid containing a cerium (IV) compound for the polishing treatment, the polishing liquid must be used for the polishing soon after

the dilution. Preferably, the polishing liquid should be used for the polishing immediately after or simultaneously with the dilution” (Appellants’ specification, p. 6, line 26 – p. 7, line 10).

The Examiner acknowledged that Westmoreland does disclose “a solution with a specific amount/concentration of water” (Examiner’s Answer, p. 9). A solution with a specific amount/concentration of water is different from Appellants’ claimed “adding a solvent for dilution to said first polishing liquid to form a second polishing liquid containing tetravalent cerium ions in a second concentration lower than the first concentration; ... wherein said addition of the solvent is carried out upon or immediately before the polishing of said substrate” (claim 17). Thus, contrary to the Examiner’s allegations, it would NOT “naturally encompass conventional preparation steps to attain the desired final concentration including the dilution step claimed by appellants” (Examiner’s Answer, p. 9) in Westmoreland. Therefore, for the reasons already on record in the Appeal Brief, amplified by the arguments presented above, Appellants submit that they have shown the elements of claim 17 are not obvious, and that the Examiner has not considered all evidence supporting the patentability of the claimed invention, nor responded thereto.

B. The Examiner also alleged “Appellants’ argument is unpersuasive because Westmoreland teaches “ [...] the material of the invention is applied to the surface and acts to remove ruthenium metal and/or ruthenium dioxide from the surface that is planarized” (column 5, lines 10 – 16), which suggests that cerium (IV) solution is also used as a polishing liquid and would be effective in removing Ru-oxide” (Examiner’s Answer, pp. 9 – 10).

In response, Appellants dispute the Examiner’s characterization that Westmoreland suggests that if a cerium (IV) solution is also used as a polishing liquid it would be effective in

removing Ru-oxide. Appellants respectfully direct the Board's attention to Westmoreland's Table 1 and Table 2. In Table 1, the row composed of the last line and fourth-from-last line in the "Material" column indicate that when crystalline RuO₂ is deposited on a substrate (Si or BSPG), the "RuO₂ film did not appear to etch within 30 min." Similarly, Table 2 shows that crystalline RuO₂ on Si "did not appear to be etched within 10 min." Westmoreland further discusses this in the disclosure, wherein "[t]he etchant also removed ruthenium dioxide from each of the three substrates if the ruthenium dioxide was deposited on the substrate in an amorphous form. *No crystalline ruthenium dioxide was removed by the CR-14 Chrome Etchant [refer to Table 1]*" (col. 8, lines 13 – 17, italics added), and "[a]s was observed with the RuO₂ films in Example 2 that were not annealed, *the annealed crystalline ruthenium dioxide film was not etched* in the procedure [refer to Table 2]" (col. 8, lines 58 – 60, italics added).

In contrast, the present invention teaches "polishing a surface of a substrate containing Ru or a Ru compound in a surface region with the second polishing liquid" (claim 17), and discusses this further in the specification, for example, on p. 19, lines 7 – 15:

"In the next step, a BaSrTiO₃ film 16 acting as a dielectric film of a capacitor is formed in a thickness of about 40 nm by a sputtering method or a CVD method. Where the BaSrTiO₃ film 16 as formed is amorphous, the film is annealed to form crystals of perovskite structure. Then, a SrRuO₃ film 17 acting as an upper electrode of the capacitor is formed by a sputtering method or a CVD method..."

In other words, when the BaSrTiO₃ film is annealed to form crystals of perovskite structure, the deposited SrRuO₃ will nucleate on the BaSrTiO₃ film surface and grow with a perovskite crystal structure. While implementing Appellants' present claimed invention, one would be able to remove Ru and Ru compounds including SrRuO₃, Appellants again note that

Westmoreland is unable to, and does not teach how to, remove any crystalline ruthenium oxide films. *See also* Appeal Brief, pp. 15 – 16.

C. Regarding the secondary Danielson reference, the Examiner also alleged “Appellants’ argument is unpersuasive because Danielson is relied upon to cure Westmoreland’s deficiency of the addition of the solvent is carried out upon or immediately before the polishing of said substrate” (Examiner’s Answer, p. 10).

In response, Appellants continue to dispute this allegation, and maintain that Danielson’s mixing produces only *one* polishing solution, and this is not equivalent to Appellants’ claimed “adding a solvent for dilution to said first polishing liquid” (claim 17). As discussed in the Appeal Brief (p. 16), Danielson teaches that polishing is carried out after mixing of an abrasive solution and an oxidant solution. Danielson’s oxidant solution, disclosed in column 4, lines 28 – 30, is a mixed solution of potassium ferricyanide and an acetate buffer, *and it is not a solvent for the abrasive solution*.

Moreover, Danielson does not cure the deficiencies of Westmoreland to allegedly produce Appellants’ claimed invention. First, as mentioned in the Appeal Brief (p. 16), Danielson does not etch or employ chemical mechanical polishing (CMP) any form of Ru or Ru compound, therefore it cannot etch or CMP crystalline ruthenium oxides. Since Westmoreland also does not etch crystalline ruthenium oxides, the combination of Danielson and Westmoreland cannot etch or CMP crystalline ruthenium oxides.

Second, Danielson’s “mixed slurry is delivered immediately to the polishing surface of the polishing pad” (column 5, lines 45 – 46), which is clearly different from Appellants’ claimed “adding a solvent for dilution to said first polishing liquid to form a second polishing liquid containing tetravalent cerium ions in a second concentration lower than the first concentration”

(claim 17). Since Danielson's oxidant solution is a mixed solution of potassium ferricyanide and an acetate buffer, and is not a solvent for the abrasive solution, it cannot satisfy the elements of Appellants' claim 17. Likewise, Westmoreland's deficiency on this point is already well-established, as it was the Examiner's reasoning for introducing the Danielson reference (*See* Examiner's Answer, p. 10). The combination of Danielson and Westmoreland cannot teach or suggest this element of Appellants' independent claim 17.

Finally, the Examiner asserted that "the reason to combine [Westmoreland and Danielson] is for the purpose of creating of slurries which give superior polish/etch rate (Danielson, column 2, lines 7-10)" (Examiner's Answer, p. 11). In response, Appellants' submit that "[c]onclusory statements of similarity or motivation, without any articulated rationale or evidentiary support, do not constitute sufficient factual findings." M.P.E.P. § 2144.08(III).

Danielson, taken in combination with Westmoreland, still does not establish that there would have been the requisite suggestion or motivation in either reference to modify them to teach or suggest Appellants' claimed invention. Even if the Examiner's reasoning of achieving the purpose of creation of slurries yielding superior polish/etch rate were true, Appellants have already established that Danielson does not teach or suggest "superior polish/etch rate" of Ru or Ru compounds (crystalline or amorphous), and Westmoreland does not teach or suggest "superior polish/etch rate" of crystalline Ru oxides. Appellants claimed "polishing a surface of a substrate containing Ru or a Ru compound in a surface region with the second polishing liquid" (claim 17) is not satisfied in Westmoreland or Danielson, taken alone or in combination. It is evident that the combination of Danielson and Westmoreland fails to provide any evidence of suggestion or motivation to combine, and that the inappropriate combination still fails to teach or suggest all the elements of the present claimed invention.

For all the reasons advanced above, supplementing those presented in the Appeal Brief of October 20, 2003, Appellants respectfully request that the Board overturn the improper 35 U.S.C. § 103(a) rejection, and permit allowance of all the rejected claims.

IV. Response to Examiner's Arguments pertaining to (B) rejection of claim 12 under 35 U.S.C. § 103(a) over Westmoreland in view of Danielson as applied to claim 17, and further in view of Takikawa, et al. (U.S. Patent No. 4,574,292)

A. The Examiner alleged "Appellants' argument is not persuasive because Takikawa is relied upon to teach said Ru compound is SrRuO_3 " (Examiner's Answer, p. 11).

In response, Appellants respectfully point out that *their own invention claims*, with support in the specification, (1) "[a] polishing method according to claim 17, wherein said Ru compound is SrRuO_3 " (Appellants' claim 12), and (2) "[a] typical example of the Ru compound that is to be polished in the present invention is SrRuO_3 " (Appellants' specification, p. 8, ll. 4 – 5)" (Appeal Brief, p. 15). If the Examiner relies on Takikawa to teach said Ru compound is SrRuO_3 , then this rejection must fail to establish *prima facie* obviousness of dependent claim 12, at least because Appellants have already demonstrated (herein, and in the Appeal Brief of October 20, 2003) that Westmoreland in view of Danielson fails to teach or suggest at least the elements of independent claim 17, from which claim 12 depends.

B. The Examiner also alleged "The motivation to combine [Takikawa with Westmoreland in view of Danielson] is derived the desirability of having a stable structure for the purpose of providing a stable structure" (Examiner's Answer, p. 12).

In response, Appellants respectfully submit that this argument does not make any sense. Appellants again note that "[c]onclusory statements of similarity or motivation, without any articulated rationale or evidentiary support, do not constitute sufficient factual findings."

M.P.E.P. § 2144.08(III). The written record, especially in the Appeal Brief of October 20, 2003, already sufficiently point out that Takikawa, taken alone or in combination with Westmoreland in view of Danielson, fails to teach or suggest at least the elements of independent claim 17, and therefore claim 12 (dependent from claim 17) is also nonobvious.

Finally, even if Takikiwa were used to teach said Ru compound is SrRuO_3 , Appellants have already demonstrated that Westmoreland in view of Danielson are incapable of etching/CMP of crystalline Ru oxides. Since SrRuO_3 , as used in the present invention, is crystalline (of perovskite structure), Takikawa adds nothing but more deficiencies to the deficiencies of Westmoreland and Danielson.

Therefore, Appellants respectfully request that the Board overturn the improper 35 U.S.C. § 103(a) rejection.

V. Response to Examiner's Arguments pertaining to (C) rejection of claim 22 under 35 U.S.C. § 103(a) over Westmoreland in view of Danielson.

The Examiner's arguments pertaining to the rejection of claim 22 duplicate those used in the rejection of claim 17. Therefore, Appellants respectfully submit that the arguments presented in Section III hereinabove are relevant to this ground of rejection, as are the arguments presented in the Appeal Brief of October 20, 2003, since independent claim 22 contains similar elements to independent claim 17.

For these reasons, Appellants respectfully request that the Board overturn the improper 35 U.S.C. § 103(a) rejection, and permit allowance of all the rejected claims.

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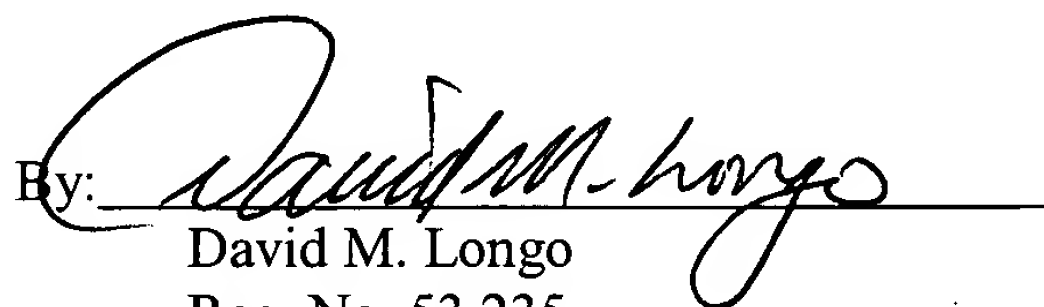
For all the reasons advanced above in the previous sections, the Board should reverse the rejections under 35 U.S.C. § 103(a), and permit allowance of all the rejected claims.

Please grant any extensions of time required to enter this Reply Brief and charge any additional fees required to our Deposit Account No. 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,
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Dated: February 18, 2004

By: 

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REPLY BRIEF

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Specifically, the Examiner stated "the issues at hand are whether a solvent is added to a first

polishing liquid for dilution to form a second polishing liquid; whether the addition of the solvent is carried out upon or immediately before the polishing of the substrate; and whether a Ru (ruthenium) compound is SrRuO_3 " (Examiner's Answer, pp. 2 – 3).

First, Appellants submit that the "issues" are not the specific claim elements Appellants' have discussed previously (in the Appeal Brief) to demonstrate the impropriety of the Examiner's rejections. Rather, the issues are those specifically outlined in the Appeal Brief, namely "B," "C," and "D" on p. 6, and Appellants respectfully draw the Board's attention to that statement of the issues, which the Examiner already acknowledged as correct. *See* Examiner's Answer, p. 3 ("the appellants' statement of the issues in brief is correct"). "In determining the differences between the prior art and the claims, the question under 35 U.S.C. 103 is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole would have been obvious. *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 218 USPQ 871 (Fed. Cir. 1983)" M.P.E.P. § 2141.02. Appellants do not wish to allow the Examiner to reduce the present invention down to only a specific subset of claim elements, while ignoring the larger issues addressed in the October 20, 2003 Appeal Brief.

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§ 2141.02.

Third, Appellants respond to the Examiner’s statement that one issue is “whether a Ru (ruthenium) compound is SrRuO_3 ” (Examiner’s Answer, p. 3), by pointing out that the language of Appellants’ claim 12, and Appellants’ specification already make clear on the record that (1) “[a] polishing method according to claim 17, wherein said Ru compound is SrRuO_3 ” (Appellants’ claim 12), and (2) “[a] typical example of the Ru compound that is to be polished in the present invention is SrRuO_3 ” (Appellants’ specification, p. 8, ll. 4 – 5)” (Appeal Brief, p. 15).

Appellants respectfully submit to the Board that the Examiner’s characterization of the issues misleads and draws attention away from Appellants’ claimed invention as a whole, and thus tends to obscure the impropriety of the Examiner’s three 35 U.S.C. § 103(a) rejections.

II. Treatment of Certain Claims

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“Appellants’ argument is not persuasive because one skilled in the art would understand that dilution steps are conventional in preparing final solutions of desired concentrations. Since the reference [Westmoreland] discloses a solution with a specific amount/concentration of water, it would naturally encompass conventional preparation steps to attain the desired final concentration including the dilution step claimed by appellants. Appellants have not shown any evidence of criticality with respect to their claimed conventional dilution step. As a result, it does not patentably distinguish the claims” (Examiner’s Answer, p. 9).

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Appellants submit that the Examiner has not fully appreciated the present invention. Appellants’ claimed polishing liquid is discussed in the specification, which points out why their claimed “addition of the solvent [that] is carried out upon or immediately before the polishing of said substrate” (claim 17) is not conventional:

“In general, a cerium (IV) compound is stable where the compound is contained in a solution in a high concentration. If the solution is diluted to lower the concentration of the cerium (IV) compound, however, the oxidizing power and polishing capability of the compound are lowered with time. It follows that, in the case of using a polishing liquid containing a cerium (IV) compound for the polishing treatment, the polishing liquid must be used for the polishing soon after

the dilution. Preferably, the polishing liquid should be used for the polishing immediately after or simultaneously with the dilution” (Appellants’ specification, p. 6, line 26 – p. 7, line 10).

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B. The Examiner also alleged “Appellants’ argument is unpersuasive because Westmoreland teaches “ [...] the material of the invention is applied to the surface and acts to remove ruthenium metal and/or ruthenium dioxide from the surface that is planarized” (column 5, lines 10 – 16), which suggests that cerium (IV) solution is also used as a polishing liquid and would be effective in removing Ru-oxide” (Examiner’s Answer, pp. 9 – 10).

In response, Appellants dispute the Examiner’s characterization that Westmoreland suggests that if a cerium (IV) solution is also used as a polishing liquid it would be effective in

removing Ru-oxide. Appellants respectfully direct the Board's attention to Westmoreland's Table 1 and Table 2. In Table 1, the row composed of the last line and fourth-from-last line in the "Material" column indicate that when crystalline RuO₂ is deposited on a substrate (Si or BSPG), the "RuO₂ film did not appear to etch within 30 min." Similarly, Table 2 shows that crystalline RuO₂ on Si "did not appear to be etched within 10 min." Westmoreland further discusses this in the disclosure, wherein "[t]he etchant also removed ruthenium dioxide from each of the three substrates if the ruthenium dioxide was deposited on the substrate in an amorphous form. *No crystalline ruthenium dioxide was removed by the CR-14 Chrome Etchant [refer to Table 1]*" (col. 8, lines 13 – 17, italics added), and "[a]s was observed with the RuO₂ films in Example 2 that were not annealed, *the annealed crystalline ruthenium dioxide film was not etched* in the procedure [refer to Table 2]" (col. 8, lines 58 – 60, italics added).

In contrast, the present invention teaches "polishing a surface of a substrate containing Ru or a Ru compound in a surface region with the second polishing liquid" (claim 17), and discusses this further in the specification, for example, on p. 19, lines 7 – 15:

"In the next step, a BaSrTiO₃ film 16 acting as a dielectric film of a capacitor is formed in a thickness of about 40 nm by a sputtering method or a CVD method. Where the BaSrTiO₃ film 16 as formed is amorphous, the film is annealed to form crystals of perovskite structure. Then, a SrRuO₃ film 17 acting as an upper electrode of the capacitor is formed by a sputtering method or a CVD method..."

In other words, when the BaSrTiO₃ film is annealed to form crystals of perovskite structure, the deposited SrRuO₃ will nucleate on the BaSrTiO₃ film surface and grow with a perovskite crystal structure. While implementing Appellants' present claimed invention, one would be able to remove Ru and Ru compounds including SrRuO₃, Appellants again note that

Westmoreland is unable to, and does not teach how to, remove any crystalline ruthenium oxide films. *See also* Appeal Brief, pp. 15 – 16.

C. Regarding the secondary Danielson reference, the Examiner also alleged “Appellants’ argument is unpersuasive because Danielson is relied upon to cure Westmoreland’s deficiency of the addition of the solvent is carried out upon or immediately before the polishing of said substrate” (Examiner’s Answer, p. 10).

In response, Appellants continue to dispute this allegation, and maintain that Danielson’s mixing produces only *one* polishing solution, and this is not equivalent to Appellants’ claimed “adding a solvent for dilution to said first polishing liquid” (claim 17). As discussed in the Appeal Brief (p. 16), Danielson teaches that polishing is carried out after mixing of an abrasive solution and an oxidant solution. Danielson’s oxidant solution, disclosed in column 4, lines 28 – 30, is a mixed solution of potassium ferricyanide and an acetate buffer, *and it is not a solvent for the abrasive solution*.

Moreover, Danielson does not cure the deficiencies of Westmoreland to allegedly produce Appellants’ claimed invention. First, as mentioned in the Appeal Brief (p. 16), Danielson does not etch or employ chemical mechanical polishing (CMP) any form of Ru or Ru compound, therefore it cannot etch or CMP crystalline ruthenium oxides. Since Westmoreland also does not etch crystalline ruthenium oxides, the combination of Danielson and Westmoreland cannot etch or CMP crystalline ruthenium oxides.

Second, Danielson’s “mixed slurry is delivered immediately to the polishing surface of the polishing pad” (column 5, lines 45 – 46), which is clearly different from Appellants’ claimed “adding a solvent for dilution to said first polishing liquid to form a second polishing liquid containing tetravalent cerium ions in a second concentration lower than the first concentration”

(claim 17). Since Danielson's oxidant solution is a mixed solution of potassium ferricyanide and an acetate buffer, and is not a solvent for the abrasive solution, it cannot satisfy the elements of Appellants' claim 17. Likewise, Westmoreland's deficiency on this point is already well-established, as it was the Examiner's reasoning for introducing the Danielson reference (*See* Examiner's Answer, p. 10). The combination of Danielson and Westmoreland cannot teach or suggest this element of Appellants' independent claim 17.

Finally, the Examiner asserted that "the reason to combine [Westmoreland and Danielson] is for the purpose of creating of slurries which give superior polish/etch rate (Danielson, column 2, lines 7-10)" (Examiner's Answer, p. 11). In response, Appellants' submit that "[c]onclusory statements of similarity or motivation, without any articulated rationale or evidentiary support, do not constitute sufficient factual findings." M.P.E.P. § 2144.08(III).

Danielson, taken in combination with Westmoreland, still does not establish that there would have been the requisite suggestion or motivation in either reference to modify them to teach or suggest Appellants' claimed invention. Even if the Examiner's reasoning of achieving the purpose of creation of slurries yielding superior polish/etch rate were true, Appellants have already established that Danielson does not teach or suggest "superior polish/etch rate" of Ru or Ru compounds (crystalline or amorphous), and Westmoreland does not teach or suggest "superior polish/etch rate" of crystalline Ru oxides. Appellants claimed "polishing a surface of a substrate containing Ru or a Ru compound in a surface region with the second polishing liquid" (claim 17) is not satisfied in Westmoreland or Danielson, taken alone or in combination. It is evident that the combination of Danielson and Westmoreland fails to provide any evidence of suggestion or motivation to combine, and that the inappropriate combination still fails to teach or suggest all the elements of the present claimed invention.

For all the reasons advanced above, supplementing those presented in the Appeal Brief of October 20, 2003, Appellants respectfully request that the Board overturn the improper 35 U.S.C. § 103(a) rejection, and permit allowance of all the rejected claims.

IV. Response to Examiner's Arguments pertaining to (B) rejection of claim 12 under 35 U.S.C. § 103(a) over Westmoreland in view of Danielson as applied to claim 17, and further in view of Takikawa, et al. (U.S. Patent No. 4,574,292)

A. The Examiner alleged "Appellants' argument is not persuasive because Takikawa is relied upon to teach said Ru compound is SrRuO_3 " (Examiner's Answer, p. 11).

In response, Appellants respectfully point out that *their own invention claims*, with support in the specification, (1) "[a] polishing method according to claim 17, wherein said Ru compound is SrRuO_3 " (Appellants' claim 12), and (2) "[a] typical example of the Ru compound that is to be polished in the present invention is SrRuO_3 " (Appellants' specification, p. 8, ll. 4 – 5)" (Appeal Brief, p. 15). If the Examiner relies on Takikawa to teach said Ru compound is SrRuO_3 , then this rejection must fail to establish *prima facie* obviousness of dependent claim 12, at least because Appellants have already demonstrated (herein, and in the Appeal Brief of October 20, 2003) that Westmoreland in view of Danielson fails to teach or suggest at least the elements of independent claim 17, from which claim 12 depends.

B. The Examiner also alleged "The motivation to combine [Takikawa with Westmoreland in view of Danielson] is derived the desirability of having a stable structure for the purpose of providing a stable structure" (Examiner's Answer, p. 12).

In response, Appellants respectfully submit that this argument does not make any sense. Appellants again note that "[c]onclusory statements of similarity or motivation, without any articulated rationale or evidentiary support, do not constitute sufficient factual findings."

M.P.E.P. § 2144.08(III). The written record, especially in the Appeal Brief of October 20, 2003, already sufficiently point out that Takikawa, taken alone or in combination with Westmoreland in view of Danielson, fails to teach or suggest at least the elements of independent claim 17, and therefore claim 12 (dependent from claim 17) is also nonobvious.

Finally, even if Takikiwa were used to teach said Ru compound is SrRuO_3 , Appellants have already demonstrated that Westmoreland in view of Danielson are incapable of etching/CMP of crystalline Ru oxides. Since SrRuO_3 , as used in the present invention, is crystalline (of perovskite structure), Takikawa adds nothing but more deficiencies to the deficiencies of Westmoreland and Danielson.

Therefore, Appellants respectfully request that the Board overturn the improper 35 U.S.C. § 103(a) rejection.

V. Response to Examiner's Arguments pertaining to (C) rejection of claim 22 under 35 U.S.C. § 103(a) over Westmoreland in view of Danielson.

The Examiner's arguments pertaining to the rejection of claim 22 duplicate those used in the rejection of claim 17. Therefore, Appellants respectfully submit that the arguments presented in Section III hereinabove are relevant to this ground of rejection, as are the arguments presented in the Appeal Brief of October 20, 2003, since independent claim 22 contains similar elements to independent claim 17.

For these reasons, Appellants respectfully request that the Board overturn the improper 35 U.S.C. § 103(a) rejection, and permit allowance of all the rejected claims.

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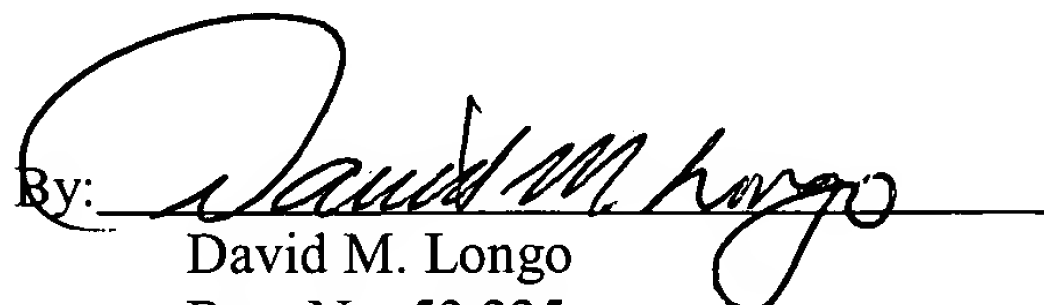
For all the reasons advanced above in the previous sections, the Board should reverse the rejections under 35 U.S.C. § 103(a), and permit allowance of all the rejected claims.

Please grant any extensions of time required to enter this Reply Brief and charge any additional fees required to our Deposit Account No. 06-0916.

Respectfully submitted,

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Dated: February 18, 2004

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